

Application Serial No. 10/069,852

REMARKS

1. The Examiner objects to original independent Claim 1 as being anticipated by the disclosure of Little (US 6,024,925) or Goodman (US 5,343,909).

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The new Claim 1 has been revised to address this objection. To be more specific, Claim 1 defines a plurality of nozzle orifices that are formed in a first surface of the dosing head. This is clearly supported original Fig. 1, which shows that the nozzle orifices are formed in the lower surface of the dosing head.

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Moreover, Claim 1 defines that the liquid reservoirs comprise reservoir openings in a second surface of the dosing head opposite to the first surface. This is also supported the figures of the application.

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It is defined in the last feature of Claim 1 that the pressure chamber is arranged such that the buffer medium does not apply a pressure to liquids in said liquid reservoirs via said reservoir openings. This feature is supported in Figs. 1, 5, 6, 7, and 8 of the application, which show that the respective pressure chambers 30, 118, 118' are arranged such that a buffer medium therein does not apply a pressure via the openings of the reservoirs, which are provided in a surface opposite to the surface in which the respective nozzle orifices 14 and 104 are provided.

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The subject matter of the revised Claim 1 can not be derived from the disclosure of Little or Goodman.

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With respect to Little, the Examiner regards the needles as having orifices at the lower end, liquid columns in the middle, and reservoirs at the top. It can clearly be derived from Fig. 2 of Little, for example, that a pressure present in the chamber 58 is applied to the openings of the needles opposite to the tips thereof, and therefore, that portions the Examiner regards as being the reservoirs, which is in clear contradiction to the last feature of the new Claim 1.

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Similarly, according to Goodman, a pressure is applied to the upper end of respective

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tips, which the Examiner regards as comprising orifices at the lower end, liquid columns in the middle, and reservoirs at the top. Thus, likewise, the teaching of Goodman is in contradiction to the last feature of the new independent Claim 1, because a pressure is applied to the top of the respective tips and, therefore, via reservoir openings formed in
5 a surface opposite to the surface in which the orifices 45 of the tips are formed.

Thus, Little and Goodman are not pertinent to the subject matter of the newly-submitted Claim 1.

10 The inventive approach defined in new Claim 1 is beneficial when compared to the prior art approaches. According to the prior art, the pressure necessary for liquid transfer is applied to all liquid regions defined by the needles (Little) or the tips (Goodman). This is disadvantageous in that the quantity of liquid which is dispensed per time unit or totally
15 either depends on the filling level of the reservoir due to the variable flow resistance at a given amplitude and a given duration of the pressure or involves the whole liquid volume.

According to the invention, the pressure is applied to only a fraction of the whole liquid volume, i.e. the quantity of liquid in the regions defined by the walls for defining a liquid
20 column and by the nozzle orifices. These regions are filled, preferably by capillary forces, from the reservoirs to a constant level continuously. Therefore, the fluidical resistance is equal in all dispensing procedures, such that at a given amplitude and a given duration of pressure, the same portion of the liquid column can be dispensed in dispense process independent of the liquid level within the reservoirs.

25 New claim 6 goes back to a combination of original Claims 1, 6, and 7. Claim 7 has not been objected to in the subject Office Action and, therefore, should be allowable as submitted.

30 2. The claims have been revised to deal with the lack of clarity objections set forth in section 1 of the subject Office Action. In this regard, the term "the liquid-column ends" has been replaced by the term "ends of the liquid-columns" in Claim 1.

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Claim 4 has been revised to define that the actor is configured to actuate the tappet to apply a pressure to the buffer medium.

5 In Claim 6, the objected term "means" has been replaced by the term "walls".

In Claim 13, the article "the" has been inserted prior to the term "liquid reservoirs".

10 It has been defined in Claim 16 that fluid lines connecting the liquid reservoirs to the liquid columns are formed, at least partially, in the silicon substrate along with the liquid reservoirs.

The objection concerning original Claim 19 is dealt with by the new Claim 1, because same defines a first surface of the dosing head.

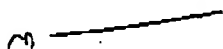
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Claim 20 has been revised to address the objections set forth in the Office Action and is directed to the dosing head alone. A dosing head having the features defined in the revised Claim 20 is neither anticipated nor suggested by the prior art.

20 Finally, Claim 21 defines that the nozzle orifice is one of the nozzle orifices defined in Claim 20.

3. Thus, the objections set forth in the Office Action are entirely addressed by the revised claims. Should the Examiner deem it helpful, he is encouraged to contact
25 Applicant's attorney, Michael A. Glenn at (650) 474-8400.

Respectfully Submitted,



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